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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/551,889	04/19/2000	Richard G. C. Williams	07452-046001	2800
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20306 7590 03/01/2004

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CHICAGO, IL 60606

EXAMINER

BURD, KEVIN MICHAEL

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/551,889

Applicant(s)

WILLIAMS, RICHARD G. C.

Examiner

Kevin M Burd

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-13, 15, 16 and 20-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 9, 12, 13, 15, 16, 20, 26, 27 and 33 is/are rejected.
- 7) ☒ Claim(s) 2-8, 10, 11, 21-25 and 28-32 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

1. This office action, in response to the amendment filed 12/18/2003, is a non final office action.

***Response to Arguments***

2. The previous objections to the figures are withdrawn. The new figures are accepted by the examiner.
3. The previous objections to the specifications and claims are withdrawn.
4. The previous rejections to the claims under 35 USC 112, second paragraph are withdrawn.
5. The indicated allowability of claims 1, 9, 12 and 13 is withdrawn in view of the newly discovered reference(s) to Dong et al (US 6,343,101). Rejections based on the newly cited reference are stated below.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 9, 20, 26, 27 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dong et al (US 6,343,101).

Regarding claims 1, 9, 20, 26, 27 and 33, Dong in col. 10, lines 45-62, col. 7, line 30 to col. 8, line 9, and figure 2 clearly discloses an encoder 40 that determines "determining step" the sign of a frame and encodes the sign ("sign encoding step") and frame ("frame encoding step"). Dong in col. 11, lines 28-34, col. 5, lines 12-67, and figure 3 further discloses a decoder 60 that receives ("receiving step") the channel output from 62, determines the sign ("determining step") and decoding ("decoding step") the output. Although Dong does not specifically disclose that the encoder and the decoder are differential encoder and decoder, Dong in col. 5, lines 65-67 and col. 11, line 54 to col. 12, line 1 does suggest that differential encoding is needed to enable the receiver to correctly decode the bits even if all received symbols have had their signals changed for reason. Based on this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate differential encoding and decoding in the system of Dong in order to limit errors (col. 5, line 66) and correctly recover the received data.

7. Claims 12, 13, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dong et al (US 6,343,101) in view of Norrell et al (US 6,084,883).

Regarding claims 12 and 15, Dong discloses the encoding method described above in paragraph 6. Dong does not disclose the differential encoding is performed before being supplied to a multiple modulus encoder. Norrell discloses a method of encoding data by generating a multiple modulus signal (abstract). This encoding will facilitate efficient data transmission and recovery by the distant receiver even in the

presence of interference (abstract). Figure 5 shows the generation of the multiple modulus coefficients is the final step completed prior to transmission of the signal (steps 120 and 130). Column 7, lines 22-39, discloses the symbols are received at the receiver and are decoded by a reverse modulus conversion to recover the binary data. It would have been obvious for one of ordinary skill in the art at the time of the invention to utilize the multiple modulus decoding method of Norrell into the method of Dong to allow the data transmission to be efficient and allow the recovery of the signal at the receiver to take place even in the presence of interference (Norrell, abstract). In addition, Norrell states another advantage of using the multiple modulus conversion encoding and decoding method is that it allows a non-integer number of bits to be mapped to each symbol, which increases efficiency (column 7, lines 22-26).

Regarding claims 13 and 16, Dong discloses the encoding method described above in paragraph 6. Dong does not disclose the frame is differentially encoded before being supplied to a multiple modulus encoder. Norrell discloses a method of encoding data by generating a multiple modulus signal (abstract). This encoding will facilitate efficient data transmission and recovery by the distant receiver even in the presence of interference (abstract). Figure 5 shows the generation of the multiple modulus coefficients is the final step completed prior to transmission of the signal (steps 120 and 130). It would have been obvious for one of ordinary skill in the art at the time of the invention to utilize the multiple modulus encoding method of Norrell into the method of Dong to allow the data transmission to be efficient and allow the recovery of the signal at the receiver to take place even in the presence of interference (Norrell, abstract). In

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addition, Norrell states another advantage of using the multiple modulus conversion encoding and decoding method is that it allows a non-integer number of bits to be mapped to each symbol, which increases efficiency (column 7, lines 22-26).

***Allowable Subject Matter***

8. Claims 2-8, 10, 11, 21-25 and 28-32 would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

***Contact information***

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**or faxed to:**

(703) 872-9314, (for formal communications intended for entry or for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Burd, whose telephone number is (703) 308-7034. The Examiner can normally be reached on Monday-Thursday from 9:00 AM - 6:00 PM.

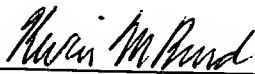
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Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3800.

  
KHAI TRAN  
PATENT EXAMINER

  
Kevin M. Burd  
PATENT EXAMINER  
2/24/04